Remarks:

Status of Claims

Claims 1-21 were previously pending. Claims 1, 3, 5, 7, 9, 11, and 13-21 are amended and claims 2 and 8 are canceled by way of this amendment. Thus, claims 1, 3-7, and 9-21 are currently pending with claims 1, 5, 7, and 16 being independent.

Amendments to the Specification

Three paragraphs are amended by way of this amendment to correct a typographical error in the definition of "SQUID." Specifically, the definition of "SQUID" in the specification has been amended to correctly read "superconducting quantum interference device." Appropriate changes have been made to the claims to similarly correct this typographical error. No new matter is added by way of this amendment as the definition of SQUID is well known in the art.

Office Action

In the June 15, 2005, Office Action, the Examiner stated that claims 5, 6, 11, 12, and 18 would be allowable if rewritten in independent form. The Examiner also rejected claims 1-4, 7-10, 13-17, and 19-21 under 35 USC 103(a) as being unpatentable over the combination of Ganther (U.S. Patent No. 6,420,868) and Hirano (U.S. Patent No. 6,498,483). Applicant respectfully submits that the Examiner's rejections are herein traversed as neither Ganther nor Hirano, alone or in combination, disclose or suggest all currently claimed features of the present invention.

Claims 1-6

Claim 1 now recites that "the unmodulated flux locked loop is located in a non-cryogenic environment, and the coaxial transmission line is adapted to extend between the non-cryogenic environment and the superconducting quantum interference device." As described on page 15 of the specification, the unmodulated flux locked loop (FLL) of the present invention may function in non-cryogenic environments due to its simplified configuration and lack of modulation elements. The

complete elimination of cryogenic circuit parts enables the transmission lines to be connected directly to a closely-packed SQUID array. In contrast, conventional modulated FLLs are limited to cryogenic environments due to their complex configuration. Similarly, Ganther only discloses and suggests utilization of a FLL in cryogenic environments (col. 3, lines 19-31).

Hirano also fails to disclose or suggest utilization of an unmodulated FLL in non-cryogenic environments as Hirano does not disclose utilization of components outside of cryogenic environments and only suggests utilization of generally conventional SQUID elements that require cryogenic environments for operation (col. 12, lines 12-15). For example, Hirano's "third embodiment" includes a heater 55 to release flux trapped as a result of cryogenic temperatures (col. 10, lines 17-22) and the "Description of the Background Art" discusses at length various problems associated with operation in exclusively cryogenic environments, including the requirement of a heater (column 2, lines 6-50). As such, Hirano only discloses or suggests utilization of a FLL in a pure-cryogenic environment. Further, due to the non-linear components utilized by Hirano, discussed in the following paragraph at length, Hirano's FLL would likely be unable to function in non-cryogenic environments. Thus, the Examiner's combination of Ganther and Hirano fails to disclose or suggest all recited features of claim 1.

Claim 4 is additionally patentable as it recites that "the unmodulated flux locked loop includes only linear, wide-band DC componentry." In contrast, both Ganther and Hirano disclose FLLs that require the inclusion of non-linear componentry. For example, Ganther requires non-linear RF components, such as a modulation oscillator, to achieve a modulated FLL (col. 4, lines 24-49). Similarly, Hirano requires utilization of non-linear components, such as a RF generator for the first embodiment (col. 6, lines 1-12), an AC source generator 32 for the second embodiment (col. 7, lines 45-50), and an oscillator circuit 66 for the third embodiment (col. 10, lines 33-35). Utilization of such non-linear components creates distortion and RF interference thereby inhibiting device functionality (page 4, lines 11-21). Thus, the Examiner's combination of Ganther and Hirano fails to disclose or suggest all recited features of claim 4.

The Examiner indicated in the June 15, 2005, Office Action that claims 5 and 6 would be allowable if rewritten in independent form. Claim 5 has been rewritten herein in independent form, and claim 6 depends from claim 5. Thus, claims 5 and 6 are now allowable.

Claims 7-15

Claim 7 now recites, in a generally similar manner to claim 1, that "the unmodulated flux locked loop is located in a non-cryogenic environment, and the coaxial transmission line is adapted to extend between the non-cryogenic environment and the superconducting quantum interference device." As discussed above in relation to claim 1, the combination of Ganther and Hirano fails to disclose or suggest this feature and claim 7 is allowable as a result.

Claim 10 is additionally patentable for the same reasons as claim 4. As discussed above, neither Ganther nor Hirano disclose or suggest a FLL including only linear, wide-band DC componentry as each must include RF or non-linear oscillating components. Thus, claim 10 is in a condition for allowance.

The Examiner indicated that claims 11 and 12 would be allowable if rewritten in independent form. Applicant has not rewritten claims 11 and 12 in independent form due to the amendment of claim 7. However, claims 11 and 12 should remain allowable if rewritten in independent form.

Claims 16-21

Claim 16 is allowable for the same reasons as claims 1 and 4. Specifically, claim 16 recites a FLL "located in a non-cryogenic and magnetically unshielded environment" and including "only linear, wide-band DC componentry." As discussed above, the combination of Ganther and Hirano fails to disclose or suggest these features. Further, claim 17 is additionally allowable as the combination of Ganther and Hirano fails to disclose or suggest transmission lines that are operable to extend between a cryogenic and a non-cryogenic environment.

Additionally, the Examiner indicated that claim 18 would be allowable if rewritten in independent form. Applicant has not rewritten claim 18 in independent form due to the allowability

of claim 16 discussed in the preceding paragraph. However, claim 18 should remain allowable if rewritten in independent form.

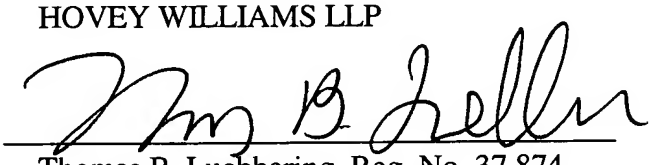
Conclusion

The Examiner's combination of Ganther and Hirano fails to disclose or suggest various currently claimed features of the present invention, including, for example, a FLL operable for location in a non-cryogenic environment and an unmodulated FLL including only linear componentry.

Thus, Applicant respectfully submits that claims 1, 3-7, and 9-21 are in allowable condition and requests a corresponding Notice of Allowance. In the event of further questions, the Examiner is urged to call the undersigned. Any additional fee which might be due in connection with this application should be applied against our Deposit Account No. 19-0522.

Respectfully submitted,

HOVEY WILLIAMS LLP

BY: 

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